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January 26, 2023

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Re: *In the Matter of Water Application No. 2850-2, Elk Mountain Water Users Association, Inc.*

To Whom It May Concern:

Enclosed please find a true and correct copy of my Notice of Appearance, Chief Engineer's Disclosure of Expert Witnesses, and Certificate of Service in the above-referenced matter.

Sincerely,

Ann F. Mines Bailey
Assistant Attorney General

AFM/mn
Enclosures
cc w/encs: Ron Duvall, DANR Water Rights Program (by interoffice mail)

RECEIVED
JAN 27 2023
OFFICE OF WATER

STATE OF SOUTH DAKOTA
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

WATER MANAGEMENT BOARD

IN THE MATTER OF WATER APPLICATION NO. 2850-2, Elk Mountain Water Users Association, Inc.	))))	NOTICE OF APPEARANCE

The undersigned attorney, Ann F. Mines Bailey, hereby notices her appearance as counsel for the Chief Engineer and the South Dakota Department of Agriculture and Natural Resources, Water Rights Program in the above-entitled action, and requests that copies of all further pleadings, affidavits, or motions in the above-entitled matter be served upon her.

Respectfully submitted this 26th day of January 2023.

MARTY J. JACKLEY
ATTORNEY GENERAL

Ann F. Mines Bailey
Assistant Attorney General
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Counsel for Chief Engineer and Water Rights Program, DANR

RECEIVED
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OFFICE OF WATER

STATE OF SOUTH DAKOTA
DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

WATER MANAGEMENT BOARD

IN THE MATTER OF WATER APPLICATION NO. 2850-2, Elk Mountain Water Users Association, Inc.	CHIEF ENGINEER'S DISCLOSURE OF EXPERT WITNESSES

Pursuant to the Procedural and Scheduling Order dated December 9, 2022, the Chief Engineer hereby provides the names of his expert witnesses:

1. Kimberly C. Drennon, Engineer, South Dakota Department of Agriculture and Natural Resources, Water Rights Program. A copy of her report regarding this application and upon which the Chief Engineer's recommendation is based is attached hereto.

2. Eric Gronlund, Chief Engineer, South Dakota Department of Agriculture and Natural Resources, Water Rights Program. Mr. Gronlund has not authored a report in this matter. The Chief Engineer's recommendation is attached hereto.

The curricula vitae for each of these individuals are also attached hereto.

Dated this 26th day of January 2023.

MARTY J. JACKLEY
ATTORNEY GENERAL

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Counsel for Chief Engineer and Water Rights Program, DANR

Report to the Chief Engineer
on Water Permit Application No. 2850-2

Elk Mountain Water Users Association, Inc
14 September 2022

Water Permit Application No. 2850-2 seeks to appropriate up to 145 acre-feet of water annually (ac-ft/yr) at a maximum pump rate of 0.333 cubic feet of water per second (cfs) from one well to be completed into the Madison aquifer (approximately 1,570 feet deep) located in the NW ¼ NW ¼ Section 21-T4S-R1E for a water distribution system, commercial use, and fire protection. The proposed system will serve users within an approximate ten-mile radius of the well, including portions of T3S-R1E, T3S-R2E, T4S-R1E, T4S-R2E, T5S-R1E, T5S-R2E, and T6S-R1E Black Hills Meridian in Custer County and T44N-R61W, T44N-R60W, T43N-R61W, T43N-R60W, T42N-R61W, T42N-R60W, T41N-R60W 6th Principal Meridian in Weston County, Wyoming. Water will also be provided to the Highlands Volunteer Fire Department and available for purchase by retail customers via a single bulk dispensing station. This site is located approximately 21 miles west of Custer, South Dakota.

Aquifer: Madison Limestone (MDSN)

Hydrogeologic Characteristics

The Madison Group in South Dakota is a Lower Mississippian and Upper Devonian group of formations that in the Black Hills consists of the Englewood and Pahasapa Limestone formations [1]. The Pahasapa Limestone is a "white, light-gray to tan, fine- to medium-grained limestone and dolomite containing brown to gray chert [2]." The Englewood Limestone is a "pink to lavender to light-gray, thin- to medium-bedded, fine- to medium-grained, argillaceous, dolomitic limestone [2]." The Madison aquifer consists of the permeable and porous portions of the Madison Group that are sufficiently saturated to deliver useful quantities of water. The Madison aquifer extends over more than 210,000 square miles in Montana, Wyoming, North Dakota, South Dakota, and Nebraska [3], although it may not be suitable as a source of water in all of those areas due to extreme depth to the aquifer and low water quality far from the outcrops [4]. It crops out in the Black Hills and is buried elsewhere in South Dakota [3]. The Madison aquifer may be hydrologically connected to the Deadwood aquifer underlying it in some locations [5]. It is also connected to the Minnelusa aquifer above it in some areas of the aquifer [5]. There are other bedrock aquifers that receive natural discharge from the Madison aquifer further away from the Black Hills where confining layers between the Madison aquifer and those aquifers are absent. The hydraulic head of the Madison aquifer is higher than land surface in many places around the Black Hills, causing some wells completed into the aquifer to flow without a pump [6]. Numerous springs and seeps in the Black Hills flow with water that has been determined to come from the Madison aquifer [7].

The applicant did not submit a well completion report with the application, but sufficient information is available to determine the availability of water and possibility of unlawful impairment of existing water rights/permits. A well completion report located approximately 0.7 miles south of this application in the SW ¼ Section 21 T4S-R1E on April 5, 2001, indicates the driller encountered fractured Madison Formation from 1,020 to the total depth of 1,140 feet below grade [6]. The static water level at the time the well was completed was 890 feet below

grade. Structure contours available in the area of this application indicate that there is 400 feet of thickness between the top of the Madison Group and the top of the Deadwood Formation [8] [9], which is the next lowest formation [1], so it is likely that well did not penetrate the full thickness of the Madison aquifer at this location.

Applicable South Dakota Codified Law (SDCL)

Pursuant to SDCL 46-2A-9, a permit to appropriate water may be issued if there is reasonable probability that there is unappropriated water available for the applicant's proposed use, that the proposed diversion can be developed without unlawful impairment of existing domestic water uses and water rights, and that the proposed use is a beneficial use and in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board. This report will only assess the availability of water and possibility of developing this application without unlawful impairment of existing domestic water uses and water rights.

Pursuant to SDCL 46-6-3.1, no application to appropriate groundwater may be approved if, according to the best information reasonably available, it is probable that the quantity of water withdrawn annually from a groundwater source will exceed the quantity of the average estimated annual recharge of the water to the groundwater source. An exception allows water distribution systems to withdraw from groundwater sources older or stratigraphically lower than the Greenhorn Formation regardless of the results of a hydrologic budget. The Madison aquifer is older and stratigraphically lower than the Greenhorn Formation and the applicant is a water distribution system as defined in SDCL 46-1-6(17). Therefore, the Water Management Board's authority to approve this application is not restricted by whether or not recharge exceeds withdrawals. However, a statewide and local hydrologic budget is included in this report for the information of the Chief Engineer and the Water Management Board.

Pursuant to SDCL 46-2A-20:

> *Notwithstanding §§ 46-1-14 and 46-2A-7, no water permit for construction of works to withdraw water from the Madison formation in Butte, Fall River, Custer, Lawrence, Meade and Pennington counties may be issued for a term of more than twenty years, unless the Water Management Board determines, based upon the evidence presented at a hearing that:*
>
> *(1) Sufficient information is available to determine whether any significant adverse hydrologic effects on the supply of water in the Madison formation would result if the proposed withdrawal were approved; and*
>
> *(2) The information, whether provided by the applicant or by other means, shows that there is a reasonable probability that issuance of the proposed permit would not have a significant adverse effect on nearby Madison formation wells and springs.*

This application proposes to withdraw water from the Madison aquifer in one of the counties listed above. Therefore, in addition to the other requirements, the Water Management Board must consider the effect this application may have on nearby Madison aquifer wells and springs and this application is subject to a 20-year term limit.

Availability of Water

Statewide Hydrologic Budget

Statewide Recharge

The Madison aquifer receives recharge from infiltration of precipitation and streamflow on the outcrop area and may also receive inflow from the underlying Deadwood aquifer [10]. There are several reports available estimating recharge to the Madison aquifer.

Woodward-Clyde Consultants [11] estimated recharge to the outcrop of the Madison aquifer in the Black Hills as part of an environmental impact statement for the ETSI Coal Slurry Pipeline Project. The upper-bound estimate of recharge in the Woodward-Clyde Consultants report is approximately 400,000 ac-ft/yr, assuming almost all of the precipitation that falls on the outcrop infiltrates into the aquifer [11]. Woodward-Clyde Consultants produced a lower-bound recharge estimate of 140,000 ac-ft/yr based on the Rahn and Gries [7] report [11]. However, the Rahn and Gries report estimated recharge for all Paleozoic limestone in the Black Hills, which includes the Madison Group, the Minnelusa Formation, and the Minnekahta Formation [7]. Rahn and Gries [7, p. 15] reported that 146.14 cfs was their minimum estimated recharge rate for the Paleozoic limestone from infiltration of precipitation, which converts to approximately 106,000 ac-ft/yr for all Paleozoic formations. The Woodward-Clyde Consultants report did not acknowledge the fact that the Rahn and Gries [7] report estimated minimum recharge for a larger group of formations than the Woodward-Clyde Consultants report covers, and therefore is likely to overestimate recharge to the Madison aquifer [11].

Carter, Driscoll, and Hamade [10] analyzed streamflow and precipitation data from water years 1931 to 1998 in the Black Hills area in South Dakota and Wyoming to determine the average annual recharge to the Madison and Minnelusa aquifers. They estimated a combined average annual recharge to both aquifers to be 344 cfs, or approximately 249,000 ac-ft/yr, not including possible flow from the Deadwood aquifer [10]. Carter, Driscoll, and Hamade [10] estimated that approximately 55% of the recharge goes to the Madison aquifer, so the total estimated average recharge to the Madison aquifer from the outcrop in the Black Hills is 137,000 ac-ft/yr, not including possible inflow from adjacent aquifers. The Carter, Driscoll, and Hamade [10] report uses more years of data, more recent data, and better assumptions than the Woodward-Clyde Consultants [11] and Rahn and Gries [7] reports. Therefore, the best estimate of recharge to the Madison aquifer is based on the Carter, Driscoll, and Hamade [10] report.

Statewide Discharge

Discharge from the Madison aquifer in South Dakota is mainly by outflow to other aquifers when the hydraulic head in the Madison aquifer is higher than those aquifers, outflow to springs and seeps, and withdrawals by domestic and appropriative wells [12]. Due to the presence of overlying aquifers and water distribution systems in many areas of the aquifer, domestic well withdrawals are a negligible portion of the hydrologic budget of the Madison aquifer. There are 161 water rights/permits currently authorized to withdraw from the Madison aquifer and 10 future use water rights/permits reserving water from the Madison aquifer. Table 1 shows the future use permits reserving water from the Madison aquifer [13].

Of the 161 active water rights/permits, 97 are primarily for some type of water distribution system (rural water system, municipal, etc), 30 primarily for irrigation, 14 for commercial use,

11 for industrial use, 4 for domestic use, 2 for geothermal use, 2 for institutional use, and one for recreation [13]. Estimated withdrawals for irrigation use are shown in Table 2. When there were more than 10 years of irrigation reports available, the average reported irrigation was used to estimate irrigation withdrawals. When there were less than 10 years of irrigation reports available, withdrawals are assumed to equal 2 acre-feet per acre although actual usage is likely less for non-turf irrigation. Non-irrigation withdrawals from permit holders with irrigation as a permitted use are assumed to withdraw at their maximum instantaneous diversion rate 60% of the time. In the case of Water Right No. 1885-1, that would have caused the total estimated withdrawal to exceed the rate they were physically capable of withdrawing, so their total estimated withdrawal is 100% of their maximum instantaneous diversion rate.

Table 1: Future Use Permits from the Madison aquifer [13]

Permit No.	Name/Business	County	Use	Priority Date	Amount Reserved (ac-ft/yr)
369-1	City of Belle Fourche	LA	MUN	12/10/1958	620
2086-2	City of Rapid City	PE	MUN	05/18/1989	4,075
439-2	City of Rapid City	PE	MUN	09/22/1956	3,367
1872-1	City of Spearfish	LA	MUN	11/13/2006	2,704
2560-2	Fall River Water Users District	FR	RWS	05/16/2005	358
2560A-2	Fall River Water Users District	FR	RWS	05/16/2005	0
2560B-2	Fall River Water Users District	FR	RWS	05/16/2005	0
2580-2	Southern Black Hills Water System	FR	RWS	03/02/2006	1,474
1833-2	Weston Heights Home Owners	MD	RWS	02/18/1983	211
1995-1	Black Hawk Water User District	MD	RWS	04/15/2020	1,300
Total					14,109
FR – Fall River, LA – Lawrence, MD – Meade, PE – Pennington MUN – Municipal, RWS – Rural Water System					

Water Right/Permit Nos. 1096-1, 1096A-1, 1496-1, and 1670-1 are all authorized to withdraw from the same well and one dam. Water Right Nos. 1096-1, 1096A-1, 1670-1 authorize diversion of water for irrigation use and Water Right No. 1096A-1 and Water Permit No. 1496-1 authorize diversion of water for rural water system use. Documentation in the administrative file for Water Right No. 1670-1 indicates that the well is not valved such that it can be shut off when not in use for the beneficial uses listed on the permits. A letter dated September 9, 1998 indicates that when the water for that well is not being used for the beneficial uses described in the permits, it is used for fish and wildlife propagation. The person writing the letter indicated they would prefer the Water Management Board not order the well to be shut off when not used for irrigation or rural water system withdrawals. It is likely the well continues to flow uncontrolled; thus, at the flow rate listed in Water Right No. 1096A-1 of 1.33 cfs, that well withdraws approximately 964 ac-ft/yr from the Madison aquifer.

Water Right No. 1650-1 does not require the water right holder to report annual withdrawals and allocates no acreage. It provides supplemental water supply from a flowing well for Water Right No. 1231-1. Water Right No. 1231-1 permits a 110 acre-ft dam to provide water for a commercial livestock operation and irrigation of 134 acres. Water Right No. 1650-1 allows for direct irrigation from a Madison aquifer well of up to 2 acre-ft per acre for the land permitted by Water Right No. 1231-1. Kilts estimated that Water Right No. 1650-1 withdraws 55.9 ac-ft/yr [14].

There are 37 water rights/permits that have a volume limit listed in their permit or have had their total withdrawal limited by a subsequent water right/permit held by the same person/entity. While many of those water rights/permits are required to report their withdrawals, they may develop their permits further to withdraw up to the limit on their permit, so the volume limit listed on their permits is assumed to be their total appropriation. The total volume limit listed by such permits is 21,011 ac-ft/yr.

Table 2: Permits with irrigation listed as one beneficial use, or are connected to an irrigation permit [13] [15]

Permit No.	Name/Business	Diversion rate (cfs)	Acres Licensed/ Permitted	Average Report (ac-ft/yr)	Years of Irrigation Reports	Estimated average irrigation (ac-ft/yr)	Est. Non-irr. Use (ac-ft/yr)	Total Est. Withdrawal (ac-ft/yr)
2773-2	Arrowhead Country Club	1.110	100.00	0	4	200.0	0.0	200.0
1635-1	Black Hills National Cemetery	0.820	54.50	94.8	26	94.8	356.4	451.2
1452-1	Black Hills State College	3.330	25.44	20.3	33	20.3	1,447.5	1,467.8
1670-1	Buddy L, Peggy A, Kami S Ireland	3.610	253.00	47.5	24	*	*	*963.5
1096A-1	Butte Meade Sanitary Dist	1.330	0.00	N/A	0	*	*	*
2458-2	City of Rapid City	0.800	107.00	104.4	21	104.4	0.0	104.4
2002-1	City of Spearfish	1.330	40.00	0.0	1	80.0	0.0	80.0
2313-2	Coca-Cola Bottling	0.330	3.00	7.3	27	7.3	143.4	150.7
1899-1	Davis Ranches Inc	1.430	100.00	0.0	13	0.0	0.0	0.0
2673-2	Diocese of Rapid City	0.120	7.00	8.0	9	14.0	0.0	14.0
1009-1	Donald F/Ann J Brady	0.780	53.73	30.4	40	30.4	0.0	30.4
1185-1		0.380	22.52	110.3	40	110.3	***	110.3
2286-2	Donald Konechne	0.100	38.50	10.2	28	10.2	0.0	10.2
1707A-1	Elkhorn Ridge @ Frawley Ranches LLC	3.705	100.00	0.0	4	0.0	1,610.5	1,610.5
1707E-1		0.000	0.00	9.1	15	9.1	**	9.1
1931-1		0.170	3.30	3.2	9	6.6	73.9	80.5
1650-1	Foothill Land & Cattle LLC	0.890	0.00	N/A	0	*	*	*55.9
1945-1	Frawley Ranches LLC	1.110	265.00	50.7	8	530.0	0.0	530.0
1858-1	Glencoe Camp Resort II LLC	0.860	34.00	0.0	16	0.0	373.8	373.8
2593-2	Hart Ranch Development	0.490	72.50	19.9	15	19.9	213.0	232.9
1911-2	Hart Ranch Development Co	0.880	124.00	120.1	28	120.1	382.5	502.6
1725-2	Janice R Crowser	1.070	75.10	1.0	23	1.0	0.0	1.0
2012-1	Jesse Horstmann	0.500	43.50	N/A	0	87.0	0.0	87.0
1923-1	Jim Montieth	0.110	3.00	1.0	10	6.0	47.8	53.8
858-2	John & Heidi Mcbride	9.360	655.75	6.7	38	6.7	0.0	6.7
1885-1	John T & Veronica Widdoss	0.110	22.00	16.8	5	44.0	35.7	79.7
1223-1	Montana Dakota Land LLC	0.670	263.00	195.4	40	195.4	0.0	195.4
1960-1	One Diamond Inc	1.280	150.00	148.9	6	300.0	556.4	856.4
1363-1	Spearfish Canyon Cntry Cl	0.900	80.10	63.3	35	63.3	0.0	63.3
2106-2	Stuart Rice	0.080	2.80	0.8	30	0.8	34.8	35.6
1842-1	Tom C Davis	0.440	330.00	0.0	17	0.0	0.0	0.0
2741-2	Tubbs Land & Cattle LLC	3.340	567.00	149.5	3	1,134.0	0.0	1,134.0
419-2	Wind Cave National Park	0.150	6.00	N/A	0	12.0	65.2	77.2
Total		41.585	3,601.74	1,219.8		3,207.8	5,340.9	9,568.1

* Discussed in text. **gives additional time to develop 1707A-1. *** Reports all use types in irrigation report

There are 89 non-irrigation water rights/permits that do not have a volume limit listed in their permit and are not discussed above. They are estimated to withdraw up to their maximum instantaneous diversion rate 60% of the time, for a total estimated withdrawal of 16,897 ac-ft/yr. Based on Water Rights Staff experience, this estimate is likely to be higher than the actual withdrawals by those water rights/permits.

In addition to the potential withdrawals by future use permits described above, four other applications are deferred, held in abeyance, or pending review. Water Permit Application No. 2585-2 for Southern Black Hills Water System seeks to appropriate 1,600 ac-ft/yr but is deferred

for further study. Water Permit Application No. 2685-2 for Powertech, Inc is held in abeyance pending federal permitting and seeks to appropriate 889 ac-ft/yr. Pending Water Permit Application No. 2013-1 seeks to appropriate 2.22 cfs to irrigate 460 acres, for a maximum possible withdrawal of 920 ac-ft/yr. Water Permit Application No. 2016-1 seeks to appropriate up to 1,600 ac-ft/yr.

Summary of Statewide Hydrologic Budget

The best available estimate of recharge to the Madison aquifer in South Dakota is approximately 137,000 ac-ft/yr. The estimated withdrawals as described in the Statewide Discharge section are summarized in Table 3. The total estimated withdrawal, including withdrawals reserved for future use and held, or deferred applications is approximately 67,554 ac-ft/yr. This application may withdraw up to 145 ac-ft/yr, if approved. Therefore, based on the statewide hydrologic budget, there is reasonable probability unappropriated water is available for this application.

Table 3: Summary of withdrawals from Madison aquifer rounded to the nearest 1 acre-foot.

Type	Count	Est. Rate (ac-ft/yr)
Irrigation (Table 2)	33	9,568
Volume limit	39	21,971
Diversion Rate limit	89	16,897
Subtotal (authorized to withdraw)	161	48,436
Future use (Table 1)	10	14,109
Deferred/held/pending	4	5,009
Grand total	175	67,554

Local Hydrologic Budget

Carter, et al used streamflow, precipitation, spring flow, estimated ground water flow, and well withdrawal data from 1987 to 1996 for the hydrologic budgets. This application is in Subarea 9 of their report. The boundaries of the Carter et al. [12] subareas were designed to minimize flow across subarea boundaries. Carter et al. [12] estimated the total recharge to the Madison and Minnelusa aquifers in Subarea 9 was 60.4 cfs. Assuming 55% of the recharge goes to the Madison aquifer, the estimated recharge in Subarea 9 is 33.2 cfs, or approximately 24,100 ac-ft/yr [10] [12]. Carter, et al. [12] do not provide values for the recharge area of the Madison and Minnelusa formations for each subarea in their report, so it is possible the proportion of recharge area to those two aquifers is different within each subarea. There are no water rights/permits authorized to withdraw, nor future use permits reserving water, from the Madison aquifer in Subarea 9. Domestic well withdrawals are negligible on the scale of this hydrologic budget. This application may withdraw up to 145 ac-ft/yr, if approved. Therefore, based on the local hydrologic budget in combination with other information available, there is reasonable probability unappropriated water is available for this application.

Observation Wells

Administrative Rule of South Dakota 74:02:05:07 requires that the Water Management Board rely upon the record of observation wells, in addition to other information, to determine that recharge exceeds withdrawals to approve an application. The Water Rights Program maintains 25 observation wells completed into the Madison aquifer [16]. The nearest observation well to

this application is CU-93C, located approximately 6 miles north of this application and the next-nearest observation well is CU-95A, located approximately 10 miles southeast of this application [16]. Figure 1 shows water level elevations in CU-93C and CU-95A [16]. Water level data in both observation wells shows a rising trend, on average. In general, water levels rise during periods of higher-than-average rainfall and decline during periods of lower-than-average rainfall. This means that recharge and natural discharge are the dominant effects in the aquifer and natural discharge is available for capture. Therefore, based on observation well analysis, there is reasonable probability unappropriated water is available for this application.

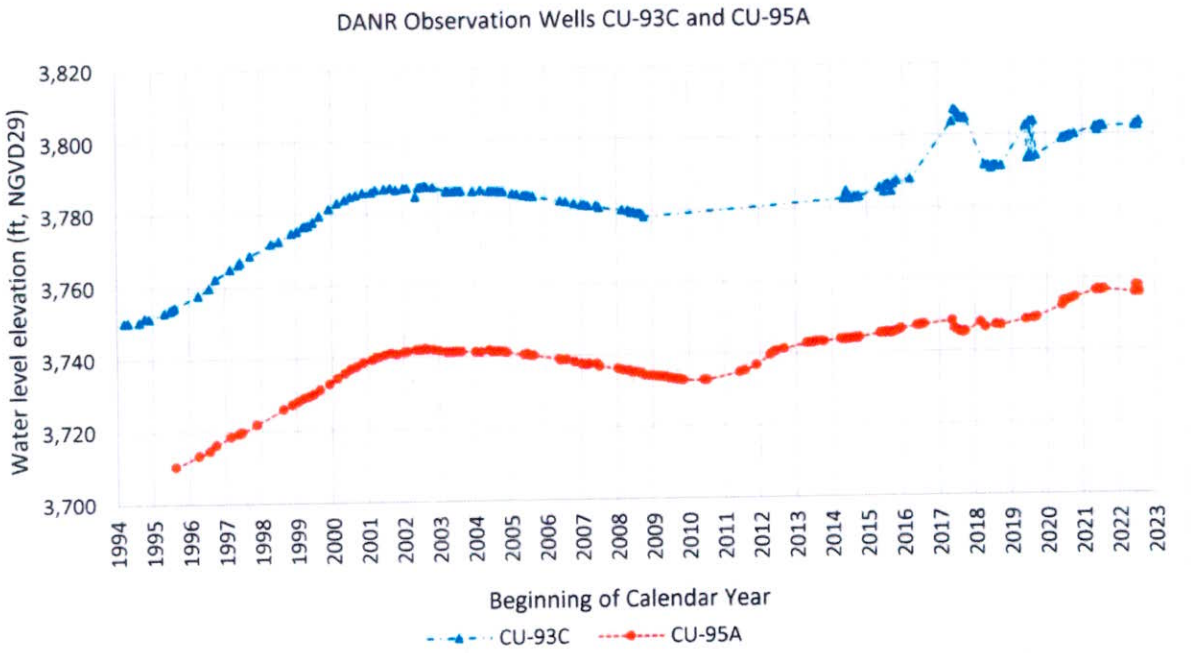

Figure 1: Water level elevations in Observation Wells CU-93C and CU-95A [16]

Possibility of Unlawful Impairment of Existing Water Rights/Permits

The nearest water rights/permits to this application that are completed into the Madison aquifer are Water Permit Nos. 2610-2 and 2730-2, located approximately 17 miles southeast of the proposed well for this application. Water Permit Application No. 2685-2 proposes to place two wells approximately 13 miles south of this application. If approved, Application No. 2685-2 would have a senior priority date to this application. The nearest domestic well completed into the Madison aquifer on file with the Water Rights Program is the well described in the Hydrogeologic Characteristics section of the report, located approximately 0.7 miles south of this application. The Water Rights Program has historically interpreted an unlawful impairment of existing water rights to occur if a junior water right/permit causes a nearby adequate well with a senior water right/permit to become unable to withdraw at the rate it is entitled to or, if a domestic well is impacted, a water right/permit causes an adequate domestic well to be unable to withdraw at the rate needed to supply reasonable domestic use of water. Administrative Rule of South Dakota 74:02:04:20(6) defines an adequate well as:

> *...a well constructed or rehabilitated to allow various withdrawal methods to be used. to allow the inlet to the pump to be placed not less than 20 feet into the saturated aquifer or formation material when the well is constructed. or to allow the pump to be placed as near to the bottom of the aquifer as is practical if the aquifer thickness is less than 20 feet*

In the hearing for Water Permit Application No. 2313-2 for Coca-Cola Bottling Company, the Water Management Board determined that to put the waters of the state to maximum beneficial use, hydraulic head would not be protected as a means of water delivery [17]. Some drawdown from this application is likely to occur and nearby well owners may need to lower their pumps or install pumps to access the water in the aquifer. Exact aquifer behavior cannot be known without an aquifer performance test. The applicant must control their withdrawals so that nearby water rights/permits and adequate domestic wells are able to withdraw necessary water. There is no record of well interference complaints from the Madison aquifer in Custer County [18]. Observation wells completed into this aquifer near larger appropriative wells show limited drawdown when the large appropriative wells are in use [16]. Given the lack of well interference complaints in this aquifer in Custer County and limited drawdown shown in observation wells completed near larger appropriations, there is reasonable probability this application can be developed without unlawful impairment of existing water rights.

Springs

There are multiple major springs located approximately 30 miles southeast of the proposed well for this application [19]. Upon considering the deferral of Water Permit Application No. 2585-2 for Southern Black Hills Water System, the Water Management Board adopted a conclusion of law stating in part, "... The only protection South Dakota law provides when considering an application for an underground water permit for flow from an artesian spring is under the public interest criteria" [20]. Given the distance between the proposed well site and the nearest springs, there is reasonable probability this application can be developed without noticeably impacting flow from the springs.

Conclusions

1. Water Permit Application No. 2850-2 seeks to appropriate up to 145 ac-ft/yr at a maximum pump rate of 0.333 cfs from one well to be completed into the Madison aquifer located in the NW ¼ NW ¼ Section 21-T4S-R1E for a water distribution system, commercial use, and fire protection.
2. Based on the hydrologic budgets and observation well analysis, there is reasonable probability unappropriated water is available for this application.
3. There is reasonable probability this application can be developed without unlawful impairment of existing water rights/permits and domestic uses.
4. There is reasonable probability this application can be developed without noticeably impacting flow from springs in the Black Hills.
5. This application is subject to a 20-year term limit.

Kimberly. C. Drennon, E.I.
Natural Resources Engineer II – DANR Water Rights Program

References

[1] M. D. Fahrenbach, F. V. Steece, J. F. Sawyer, K. A. McCormick, G. L. McGillivray, L. D. Schulz and J. A. Redden, "South Dakota Stratigraphic Correlation Chart," SD DANR Geological Survey Program, Vermillion, South Dakota, 2010. Oil and Gas Investigation 3.

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DEPARTMENT of AGRICULTURE and NATURAL RESOURCES
JOE FOSS BUILDING
523 E. CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

RECOMMENDATION OF CHIEF ENGINEER FOR WATER PERMIT APPLICATION NO. 2850-2, Elk Mountain Water Users Association Inc.

Pursuant to SDCL 46-2A-2, the following is the recommendation of the Chief Engineer, Water Rights Program, Department of Agriculture and Natural Resources concerning Water Permit Application No. 2850-2, Elk Mountain Water Users Association Inc., 25612 Dewey Road, Custer SD 57735.

The Chief Engineer is recommending APPROVAL of Application No. 2850-2 with a twenty-year term pursuant to SDCL 46-1-14 and 46-2A-20 because 1) although evidence is not available to justify issuing this permit without a 20 year term limitation, there is reasonable probability that there is unappropriated water available for the applicant's proposed use, 2) the proposed diversion can be developed without unlawful impairment of existing domestic water uses and water rights, 3) the proposed use is a beneficial use and 4) it is in the public interest as it pertains to matters of public interest within the regulatory authority of the Water Management Board with the following qualifications:

1. In accordance with SDCL 46-1-14 and 46-2A-20, Permit No. 2850-2 is issued for a twenty-year term. Pursuant to SDCL 46-2A-21, the twenty-year term may be deleted at any time during the twenty-year period or following its expiration. If the twenty-year term is not deleted at the end of the term, the permit may either be cancelled or amended with a new term limitation of up to twenty years. Permit No. 2850-2 may also be cancelled for nonconstruction, forfeiture, abandonment or three permit violations pursuant to SDCL 46-1-12, 46-5-37.1 and ARSD 74:02:01:37.
2. The well will be located near domestic wells and other wells which may obtain water from the same aquifer. The well owner, under these Permits shall control withdrawals so there is not a reduction of needed water supplies in adequate domestic wells or in adequate wells having prior water rights.
3. The well authorized by Permit No. 2850-2 shall be constructed by a licensed well driller and construction of the well and installation of the pump shall comply with Water Management Board Well Construction Rules, Chapter 74:02:04 with the well casing pressure grouted (bottom to top) pursuant to Section 74:02:04:28.
4. The Permit holder shall report to the Chief Engineer annually the amount of water withdrawn from the Madison aquifer.
5. Water Permit No. 2850-2 appropriates up to 145 acre-feet of water annually.

See report on application for additional information.

Eric Gronlund, Chief Engineer
September 19, 2022

Kimberly C. Drennon

Experience

South Dakota Department of Agriculture and Natural Resources – Water Rights Program. *Natural Resources Engineer I*, Jan. 2019 - Mar. 2021. *Engineer II*, Mar. 2021 - Present

- Perform technical reviews of ground and surface water permit applications
- Install water level loggers for special projects
- Inspect state-owned dams for Safety of Dams Program
- Assist Livestock Services Program in Nutrient Management Plan reviews Sep.- Oct. 2020
- Review and respond to constituent complaints regarding water rights/permits and wells
- Measure lake and observation well water levels

South Dakota School of Mines and Technology *Research Assistant*, Aug. 2015 – Dec. 2017

- Research effect of air particles on transport of phthalates
- Analyze gas samples with Gas Chromatograph/Mass Spectrometer/Automatic Thermal Desorber

South Dakota School of Mines and Technology *Teaching Assistant*, Aug. 2015 – Dec. 2016

- Grade and assist students for Fluid Mechanics, Introduction to Environmental Engineering I and II, Engineering Projects in Community Service (EPICS)

GSI Engineering, Urbandale IA. *Engineering Technician*. Summer 2015

- Quality assurance on construction sites including concrete compression, slump, and air entrainment tests
- Laboratory soil tests including Atterberg limits, sieve, hydrometer, and Proctor compaction
- Collected rainwater runoff samples using ISCO sampler

Gage Brothers Concrete Products: *Quality Control Intern*. Summer 2014

- Quality control concrete tests including concrete compression, slump, and air tests
- Check form construction for accuracy to plans

Education

South Dakota School of Mines and Technology, Master's Degree in Civil and Environmental Engineering, Dec. 2018

Dordt University: Bachelor of Science in Engineering, Civil Emphasis, May 2015
Senior Design Project: Water Resources Management for Esther School in Zambia, Africa

Skills and Certifications

Engineer Intern certified May 2015, State of Iowa.

Proficient in ESRI ArcMap, HEC-HMS, HEC-RAS, Adobe Illustrator.

Eric S. Gronlund PE
Chief Engineer
SD-DANR, Water Right Program

Education

B.S. Agricultural Engineering, South Dakota State University (December 1983).

Registration

SD Licensed Professional Engineer (Certification No. 7104)

Career Experience

TITLE: Chief Engineer, Water Rights Program (February 2020 - Present)
ORGANIZATION: Department of Agriculture and Natural Resources Office of Water, Water Rights Program
MAJOR DUTIES: Chief Engineer is an adviser to the Water Management Board regarding the development, conservation and allocation of the right to use the waters of the state. This includes making a recommendation on water permit applications and administers the appropriation of water resources in South Dakota to protect the public welfare and interest in the development of the water resources and determine in what way the water of the state should be developed for the greatest public benefit. Administers the South Dakota dam safety program.

TITLE: Engineering Manager I (2019 – February 2020)
ORGANIZATION: DENR – Division of Environmental Services, Water Rights Program
MAJOR DUTIES: Provide engineering and program management for the appropriation of water in South Dakota including coordinating, planning and directing processing of water permit applications. Coordinate activity of the Water Management Board in conducting contested case hearings. Establish goals for team members conducting review of applications to appropriate water, conducting licensing investigations and complaint investigations. Provide technical engineering guidance to staff engineers in review of application to appropriate water. Technical review of staff engineer's reports on applications to ensure criteria for issuance of permit are met. Direct public notice process and issuance of approved water right permits. Oversee licensing of water permits determining the level of development of permitted water use systems. Presentations of water right law and regulations. Team leader directing work of three staff engineers and four water right inspectors.

TITLE: Natural Resources Engineering Specialist or Engineer III (1990 – 2018)
ORGANIZATION: DENR – Division of Environmental Services, Water Rights Program
MAJOR DUTIES: Administer day to day operation of the water right permitting process. This includes review of application completeness, review of the engineering aspects of proposed projects, participation in the report writing process, preparation of public notice and scheduling. Knowledge of the water rights regulations. Communicate the water right regulations and permitting process to citizens and other agencies. Provide advice on engineering principles and the application of state water rights law. Conduct water permit licensing investigations and complaint investigations. Review engineering studies and provide technical assistance.

TITLE: Natural Resources Engineer III (1984 – 1989)
ORGANIZATION: DENR- Division of Technical and Financial Assistance
MAJOR DUTIES: Manage major project development, including state liaison on project development and grant administration for water projects throughout South Dakota. Team member for the James River Restoration Project with specific responsibility for the hydraulic analysis of project alternatives using HEC-2 modeling. Review engineering studies and provide technical assistance.

TITLE: Research Assistant (summer seasonal 1978 – 1983)
ORGANIZATION: SDSU – West River Research and Extension Center
MAJOR DUTIES: Conduct range research including field sampling, data processing, soil sampling, surveying and data analysis.

Memberships

- Association of Western State Engineers
- Western States Water Council
- National Water Supply Alliance
- Upper Missouri Water Association

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STATE OF SOUTH DAKOTA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

WATER MANAGEMENT BOARD

IN THE MATTER OF WATER APPLICATION NO. 2850-2, Elk Mountain Water Users Association, Inc.	))))	CERTIFICATE OF SERVICE

The undersigned hereby certifies that true and correct copies of the Notice of Appearance and Chief Engineer's Disclosure of Expert Witnesses, in the above matter, were served by U.S. mail, first-class, postage prepaid, upon the following on this 26th day of January 2023:

Susan Anderson
Elk Mountain Water Users Association, Inc.
P.O. Box 6062
Custer, SD 57730

Travis Paulton'
10693 Pass Creek Road
Edgemont, SD 57735

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Tomas and Eraclio Martinez
25663 Dewey Road
Edgemont, SD 57735

And on the same date, the originals were filed by interoffice mail with:

Ron Duvall, DANR Water Rights Program
Joe Foss Building
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